APPENDIX G
UNITS OF MEASUREMENT

Weight

g	gram(s)	1 g	=	0.3035 oz
kg	kilogram(s)	1 kg	=	2.2 lb or 1,000 g
lb	pound(s)	1 lb	=	0.45 kg
mg	milligram(s)	1 mg	=	1/1,000 g; 10^{-3} g
Mg	megagram(s), metric ton(s)	1 Mg	=	10^{6} g or 2,205 lb
ng	nanogram(s)	1 ng	=	10^{-9} g
oz	ounce(s) (avoirdupois)	1 oz	=	28.3 g
ppb	parts per billion	1 ppb	=	µg/kg
ppm	parts per million; when referring to dosing in a feeding study, ppm may be used to express the concentration of the substance in the feed (see also Airborne Concentrations below).	1 ppm	=	mg/kg
ppt	parts per trillion	1 ppt	=	ng/kg
µg	microgram(s)	1 µg	=	10^{-6} g
mg/kg	when referring to dosing, it means milligrams (mg) of chemical administered per kilogram (kg) body weight of the dosed animal.			
mol	mole, molecular weight (mol. wt.) in grams			

Volume

cc or cm^3	cubic centimeter(s)	1 cc	=	approximately 1 mL
gal	gallon(s) (U.S.)	1 gal	=	3.8 L
l or L	liter(s)	1 l	=	1.05 liquid quarts
m^3	cubic meter(s)	1 m^3	=	35 cubic feet
ml or mL	milliliter(s)	1 mL	=	10^{-3} L
ft^3	cubic foot (feet)	1 ft^3	=	0.028 m^3

Length

cm	centimeter(s)	100 cm	=	1 m
km	kilometer(s)	1 km	=	0.6 mile
m	meter(s)	1 m	=	3.3 feet
mm	millimeter(s)	1 mm	=	1/1,000 m; 10^{-3} m

Temperature

°C	degree(s) Celsius	°C	=	(°F - 32) x 5/9
°F	degree(s) Fahrenheit	°F	=	(°C x 9/5) + 32

Exponentials

10^2, 10^3, 10^6, etc.: superscripts refer to the number of times "10" is multiplied by itself, e.g., 10^2 = 10 x 10 = 100; 10^3 = 10 x 10 x 10 = 1,000.

Airborne Concentrations

mg/m^3 milligram(s) per cubic meter air

ppm part per million; 1 ppm = $1/10^6 = 1 \times 10^{-6}$

mppcf millions of particles per cubic foot of contaminated air based on impinger samples counted by light-field techniques; mppcf x 35.3 = millions of particles per cubic meter.

(1) Permissible Exposure Limit (PEL) in ppm =

$$\frac{(\text{PEL in mg/m}^3)\ (24.45\ \text{L})\ \ (\text{m}^3/1000\text{L})}{(\text{mol. wt. in g})\ (1000\ \text{mg/g})}$$

(2) PEL in mg/m^3 = $$\frac{(\text{PEL in ppm} \times 10^{-6})\ (\text{mol. wt. in g})\ (1000\ \text{mg/g})}{(24.45\ \text{L})\ (\text{m}^3/1000\ \text{L})}$$

where ppm equal the parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 torr barometric pressure, and where 24.45 L is the volume occupied by 1 mol of the vapor or gas under these conditions.

Let x = value of PEL in mg/m^3 and $y \cdot 10^{-6}$ = the value of the PEL in ppm. Then equation (2) reduces to

$$x\ \text{mg/m}^3 = \frac{(y)\ (\text{mol. wt.})\ \text{mg/m}^3}{24.45}$$

and equation (1) reduces to

$$y\ \text{ppm} = \frac{24.45\ x}{\text{mol. wt.}}$$